

CORRECTED VERSION

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
9 September 2005 (09.09.2005)

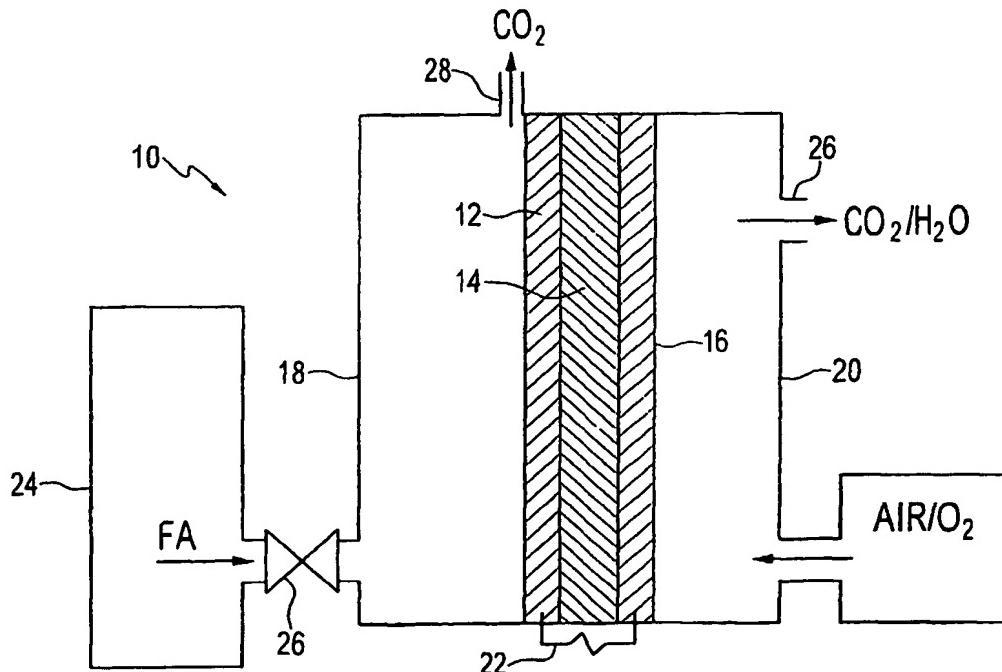
PCT

(10) International Publication Number
WO 2005/081706 A2

(51) International Patent Classification:	Not classified	US	10/407,385 (CIP)
		Filed on	4 April 2003 (04.04.2003)
(21) International Application Number:	PCT/US2004/037109	US	10/664,772 (CIP)
		Filed on	17 September 2003 (17.09.2003)
(22) International Filing Date:	5 November 2004 (05.11.2004)	(71) Applicant (for all designated States except US):	THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS [US/US]; 506 South Wright Street, 352 Henry Administration Building, Urbana, IL 61801 (US).
(25) Filing Language:	English	(72) Inventors; and	
(26) Publication Language:	English	(75) Inventors/Applicants (for US only):	MASEL, Richard, I. [US/US]; 2603 Lakeview, Champaign, IL 61822 (US). LARSEN, Robert [US/US]; 1003 Francis Dr., Apt. #1, Champaign, IL 61821 (US). HA, Su Yun [US/US]; 1523 Lincolnshire Dr., Apt. 9, Champaign, IL 61821 (US).
(30) Priority Data:	60/519,095 12 November 2003 (12.11.2003) US 10/817,361 2 April 2004 (02.04.2004) US	(74) Agents:	FALLON, Steven, P. et al.; Greer, Burns & Crain, Ltd., Suite 2500, 300 South Wacker Drive, Chicago, IL 60606 (US).
(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier applications:	US Filed on	Not furnished (CON) Not furnished	

[Continued on next page]

(54) Title: FORMIC ACID FUEL CELLS AND CATALYSTS



WO 2005/081706 A2

(57) Abstract: An exemplary fuel cell of the invention includes a formic acid fuel solution in communication with an anode (12, 134), an oxidizer in communication with a cathode (16, 135) electrically linked to the anode, and an anode catalyst that includes Pd. An exemplary formic acid fuel cell membrane electrode assembly (130) includes a proton-conducting membrane (131) having opposing first (132) and second surfaces (133), a cathode catalyst on the second membrane surface, and an anode catalyst including Pd on the first surface.



(81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US (patent), UZ, VC, VN, YU, ZA, ZM, ZW.

(84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,

SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

(48) **Date of publication of this corrected version:**

27 October 2005

(15) **Information about Correction:**

see PCT Gazette No. 43/2005 of 27 October 2005, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.